January 1, 2015

Actuarial Valuation Report

Massachusetts Housing Finance Agency Retirement System

Lawrence B. Stone
President

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July 9, 2015

Massachusetts Housing Finance Agency Retirement Board
One Beacon Street
Boston, MA 02108-4805

Dear MHFA Retirement Board:

Stone Consulting, Inc. has performed a January 1, 2015 actuarial valuation of the Massachusetts Housing Finance Agency Retirement System. This valuation and report was prepared using generally accepted actuarial principles and practices. To the best of our knowledge, this report is complete and accurate, and the assumptions used represent a reasonable estimate of anticipated experience of the system.

As part of performing the valuation, Stone Consulting, Inc. was furnished member data by the MHFA Retirement System's administrative staff. Although examined for general reasonableness, the data was not audited by the actuary. In addition, the administrative staff furnished financial statements that were not audited by the actuary or by the plan's auditors.

The funding objective of the plan is to fully fund the system while attempting to maintain a stable contribution amount for the upcoming fiscal year that is consistent with prior funding schedules or if employer finances allow it, to increase the contribution amount. This funding objective is being met. The system's funding policy, i.e. funding schedule, is sufficient to achieve full funding as well as maintain or improve the future funding status.

We anticipate over time the contribution level to decrease as a percentage of payroll. The contribution rate is determined by adding the normal cost plus a level amortization of the unfunded actuarial accrued liability. The normal cost is expected to remain at a level percentage of payroll. The length of the funding schedule contained in this actuarial valuation report is seven years (fully funded in Fiscal 2022).

The contribution amount for Fiscal Year 2016 is $6,064,900 which is $2,099,949 more than the anticipated contribution amount for Fiscal 2016 from the prior funding schedule. PERAC and GASB guidelines indicate that actuarial valuations should be conducted at least every other year. The MHFA Retirement Board conducted their previous actuarial valuation effective January 1, 2013 and are conducting actuarial valuations biennially.

Future actuarial measurements may differ significantly from current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status and changes in plan provisions or applicable law. Due to the limited scope of the assignment, we did not perform an analysis of the potential range of such future measurements.

We believe the funding status adequately reflects the need and amount of future employer contributions. We believe the funded status does not reflect the sufficiency or insufficiency of plan assets on a termination basis since the funding status reflects future pay increases which would not be included on a termination basis and is therefore not a measure of termination benefits.

We are pleased to present the results of this valuation. If the Retirement Board has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in inaccurate or misleading understanding of the results.

I, Lawrence Stone, am a consultant for Stone Consulting, Inc. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.
Actuaries for the Plan

Lawrence B. Stone
Member, American Academy of Actuaries

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Introduction

This report presents the results of the actuarial valuation of the MHFA Retirement System. The valuation was performed at the request of the Retirement Board as of January 1, 2015 for the purpose of determining the contribution requirements for Fiscal Year 2016 and beyond. The contribution requirements are based on:

- The financial condition of the system as of December 31, 2014
- The benefit provisions of M.G.L. Chapter 32 and related statutes;
- The demographics of members in the system (i.e., active and inactive participants, retirees and beneficiaries as of January 1, 2015);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

January 1, 2015 Valuation Summary

	January 1, 2015	January 1, 2013	Change
Contribution Fiscal 2016	$6,064,900	$3,964,951	$2,099,949
Funding Schedule Length	7 years	7 years	0 year
Funding Ratio	79%	80%	-1%
Amortization Increase	0.00%	0.00%	0.00%
Interest Rate Assumption	7.75%	7.875%	-0.125%
Salary Increase Rate Assumption	5% grading down to 3.50%	5% grading down to 3.50%	0.00%

- The Fiscal Year 2016 contribution is $2,099,949 more than the planned 2016 contribution. Stone Consulting, with agreement from the Retirement Board, values assets using market value of assets.

  The System experienced a 7.5% annual average annual return over the past two years on the market value of assets versus our assumption of a 7.875% return which resulted in a $1.1 million net actuarial loss. The System's asset portfolio, effective December 31, 2014 was 63% equities and 37% fixed income and short-term investments. The interest rate assumption was changed to 7.75% to reflect anticipated market performance.

- The salary increase assumption is based on the same select and ultimate table as the prior valuation. Total compensation changed by 11.4% over the prior valuation; however average annual compensation (compensation divided by number of active members) changed by 8.4%. This assumption is based on expected future experience.

- The funding level of the MHFA Retirement System is 79% compared to 80% for the January 1, 2013 actuarial valuation. The funding level is estimated to be in the top quartile of Massachusetts' Contributory Retirement Systems.

  The schedule length is seven (7) years (which is the same as the remaining schedule from the prior valuation). The maximum period permitted under Section 22D of Chapter 32 of the Massachusetts General Laws is 13 years (2030). The amortization percentage stayed the same as the prior valuation, while increasing the FY2016 contribution level compared to the prior valuation. The maximum annual amortization increase permitted is 4.50%.

- Non-economic assumptions were changed from the January 1, 2013 actuarial valuation. The mortality assumptions are based upon the RP2000 Table (sex-distinct) increased with Generational mortality and Scale BB. The previous assumption used an 18 year projection with Scale AA. The net effect of this change increased the accrued liability by $5.6 million and gross normal cost by $139 thousand.

- The mortality assumption choice reflects the recent Society of Actuaries development of the RP2014 mortality table and the MP2014 mortality projection scale. This research along with the experience of the local systems suggest a mortality assumption between RP2000 and the RP2014 and MP2014. This contributed to the RP2000 generational mortality choice.

- The withdrawal, disability incidence and retirement assumptions are based on the most recent PERAC PERAC experience study of local retirement board. However, the retirement assumptions for members hired after April 1, 2012 have been adjusted to reflect the anticipated effect on retirement patterns due to the significant changes in benefit structure for those recent hires. We used our professional judgement to make these adjustments since there will not be any significant actual retirement experience for many years.

January 1, 2015 Actuarial Valuation Results

	January 1, 2015	January 1, 2013	Percentage Change*
Funding			
Contribution for Fiscal 2016	$6,064,900		
Contribution for Fiscal 2016 based on current schedule		$3,964,951	53%
Members			
▪ Actives			
a. Number	337	328	2.7%
b. Annual Compensation	$31,240,295	$28,044,247	11.4%
c. Average Annual Compensation	$92,701	$85,501	8.4%
d. Average Attained Age	50.5	50.0	1.0%
e. Average Past Service	14.9	15.0	-0.6%
▪ Retired, Disabled and Beneficiaries			
a. Number	130	117	11.1%
b. Total Benefits	$5,012,416	4,107,926	22.0%
c. Average Benefits	$ 38,557	$35,110	9.8%
d. Average Age	70.1	69.6	0.8%
▪ Inactives			
a. Number	44	49	-10.2%
Normal Cost			
a. Gross Normal Cost	$3,129,181	$2,595,185	20.6%
b. Less Expected Members' Contributions	2,877,140	2,571,688	11.9%
c. Normal Cost to be funded by the Agency	$252,041	$23,497	972.7%
d. Six month adjustment	4,682	437	972.7%
e. Administrative Expense Assumption	481,000	471,000	2.1%
f. Adjusted Normal Cost and Expense	$737,723	$494,934	49.1%

* From prior valuation to this valuation.

	January 1, 2015	January 1, 2013	Percentage Change
Actuarial Accrued Liability as of January 1, 2015			
a. Active Members	$91,458,989	$77,788,852	17.6%
b. Inactive Members	2,480,082	1,941,220	27.8%
c. Retired Members and Beneficiaries	50,596,891	39,365,981	28.5%
d. Total	$144,535,962	$119,096,053	21.4%
Unfunded Actuarial Accrued Liability			
a. Actuarial Accrued Liability	$144,535,962	$119,096,053	21.4%
b. Less Actuarial Value of Assets	113,875,239	94,975,675	19.9%
c. Unfunded Actuarial Accrued Liability	$30,660,723	$24,120,378	27.1%
d. Six month adjustment	$1,296,747	$943,946	
e. Adjusted Unfunded Actuarial Accrued Liability	$31,957,470	$25,064,324	

- The data was supplied by the MHFA Retirement Board. The data was checked under broad parameters for reasonableness. With the assistance of the staff of the MHFA Retirement Board, we were able to develop a database sufficient for valuation purposes.
- Payroll changed by 11.4% over the course of the past two years. Average annual compensation changed by 8.4% over the same time period.
- The salary increase assumption includes general wage adjustments, step increases, and promotional increases.

History of Active Participants

Valuation Year	Number	Average Age	Average Past Service	Average Annual Compensation
2015	337	50.5	14.9	$92,701
2013	328	50.0	15.0	$85,501
2011	354	48.3	13.7	$84,023
2009	349	46.7	10.5	$81,592
2007	334	45.8	9.9	$76,532
2005*	315	43.8	8.5	$71,966
2002	312	43.6	7.9	$65,134

*(EE Data as of 1/1/2004)

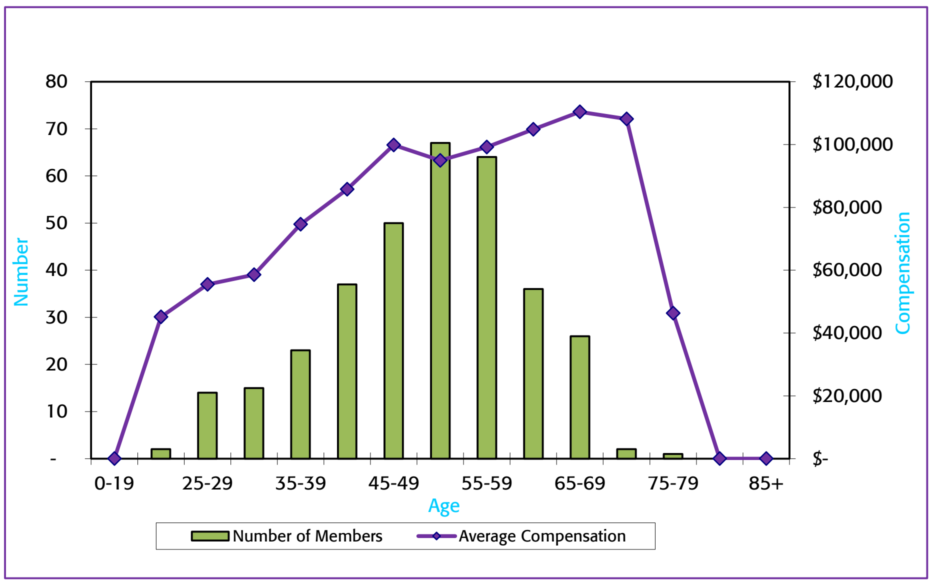
- Employee age has increased by 6.9 years and service has increased by 7.0 years over the past thirteen years. Average annual compensation has grown by 42.3% over the same time period (2.7% per year).

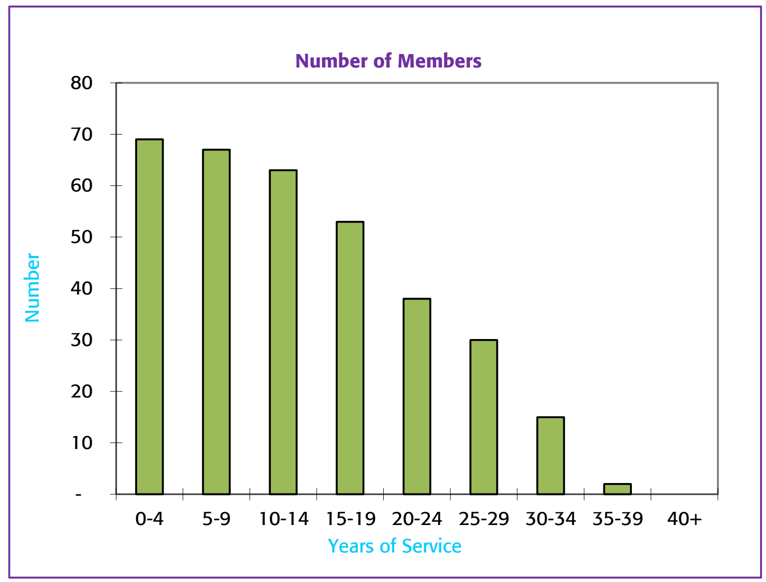
The charts on the following pages summarize demographic information regarding active and retiree members.

Distribution of Plan Members as of January 1, 2015

Active Members

AGE	0-4 Years	5-9 Years	10-14 Years	15-19 Years	20-24 Years	25-29 Years	30-34 Years	35-39 Years	40 + Years	Total	Total Compensation	Average Compensation
0-19	-	-	-	-	-	-	-	-	-	-	$ -	$ -
20-24	2	-	-	-	-	-	-	-	-	2	90,244	45,122
25-29	13	1	-	-	-	-	-	-	-	14	776,788	55,485
30-34	6	6	3	-	-	-	-	-	-	15	878,336	58,556
35-39	8	11	2	1	1	-	-	-	-	23	1,716,837	74,645
40-44	7	14	11	4	1	-	-	-	-	37	3,172,730	85,749
45-49	10	6	14	9	5	6	-	-	-	50	4,993,536	99,871
50-54	9	17	12	11	9	7	2	-	-	67	6,358,920	94,909
55-59	10	5	10	14	11	5	8	1	-	64	6,345,826	99,154
60-64	1	4	6	8	5	7	5	-	-	36	3,774,030	104,834
65-69	2	3	5	5	6	4	-	1	-	26	2,870,516	110,404
70-74	1	-	-	-	-	1	-	-	-	2	216,248	108,124
75-79	-	-	-	1	-	-	-	-	-	1	46,285	46,285
80-84	-	-	-	-	-	-	-	-	-	-	-	-
85+	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	69	67	63	53	38	30	15	2	-	337	$ 31,240,295	$ 92,701





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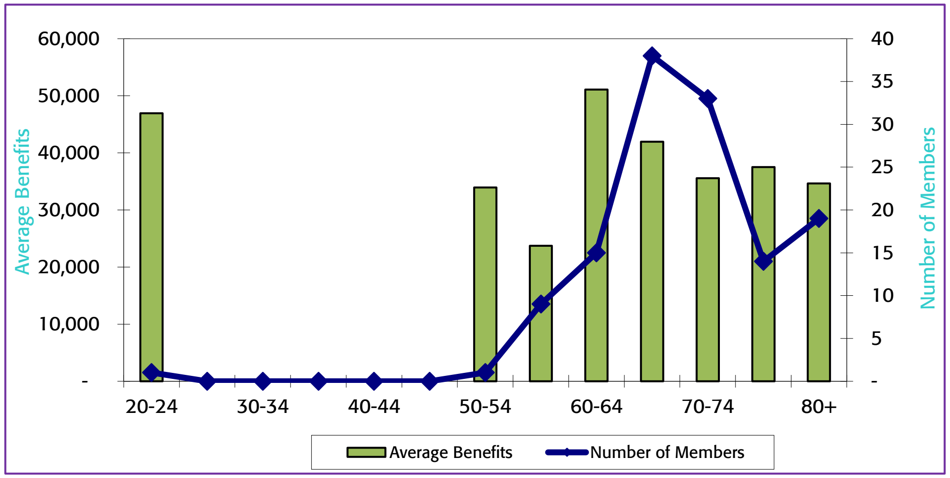
Distribution of Plan Members as of January 1, 2015

Retired Members

Retired Members and Beneficiaries			
Age	Number	Average Benefit	Total Benefit
20-24	1	46,933	46,933
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	-	-	-
45-49	-	-	-
50-54	1	33,965	33,965
55-59	9	23,731	213,578
60-64	15	51,080	766,195
65-69	38	41,973	1,594,989
70-74	32	35,625	1,139,999
75-79	13	36,756	477,823
80+	19	34,646	658,280
TOTAL	128	$ 38,529	$ 4,931,761

Disabled Members			
Age	Number	Average Benefit	Total Benefit
20-24	-	-	-
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	-	-	-
60-64	-	-	-
65-69	-	-	-
70-74	1	33,356	33,356
75-79	1	47,299	47,299
80+	-	-	-
TOTAL	2	$ 40,327	$ 80,655

Total			
Age	Number	Average Benefit	Total Benefit
20-24	1	46,933	46,933
25-29	-	-	-
30-34	-	-	-
35-39	-	-	-
40-44	-	-	-
45-49	-	-	-
50-54	1	33,965	33,965
55-59	9	23,731	213,578
60-64	15	51,080	766,195
65-69	38	41,973	1,594,989
70-74	33	35,556	1,173,354
75-79	14	37,509	525,122
80+	19	34,646	658,280
TOTAL	130	$ 38,557	$ 5,012,416



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Valuation Methodology

Stone Consulting, Inc. used the Entry Age Normal actuarial funding method in this actuarial valuation. The use of the Entry Age Normal actuarial funding method is consistent with the requirements of Chapter 32 of the Massachusetts General Laws.

NORMAL COST

Valuation Date	January 1, 2015	% of Payroll*
Gross Normal Cost (GNC)	$3,129,181	10.0%
Employees Contribution	$2,877,140	9.2%
Net Normal Cost (NNC)	$252,041	0.8%
Adjusted to Beginning of Fiscal Year 2016	$4,682	
Administrative Expense	$481,000	1.5%
Adjusted Net Normal Cost With Admin. Expense	$737,723	

*Payroll paid in 2014 for employees as of January 1, 2015 is $31,240,295. Payroll for new hires in 2014 was annualized.

- The gross normal cost (GNC) is the “price” of benefits accruing in the current year if the assumptions underlying the normal cost were realized.

- An individual normal cost represents that part of the cost of a member’s future benefits that are assigned to the current year as if the costs are to remain level as a percentage of the member’s pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and withdrawals) are included in this calculation.

- Anticipated employee contributions to be made during the year are subtracted from the GNC to determine employer normal cost, or net normal cost (NNC).

- Administrative expenses added to the NNC. The administrative expense does not include investment manager and custodial fees. These fees are considered part of the interest rate assumption that is net of fees.

Actuarial Accrued Liability and Funded Status

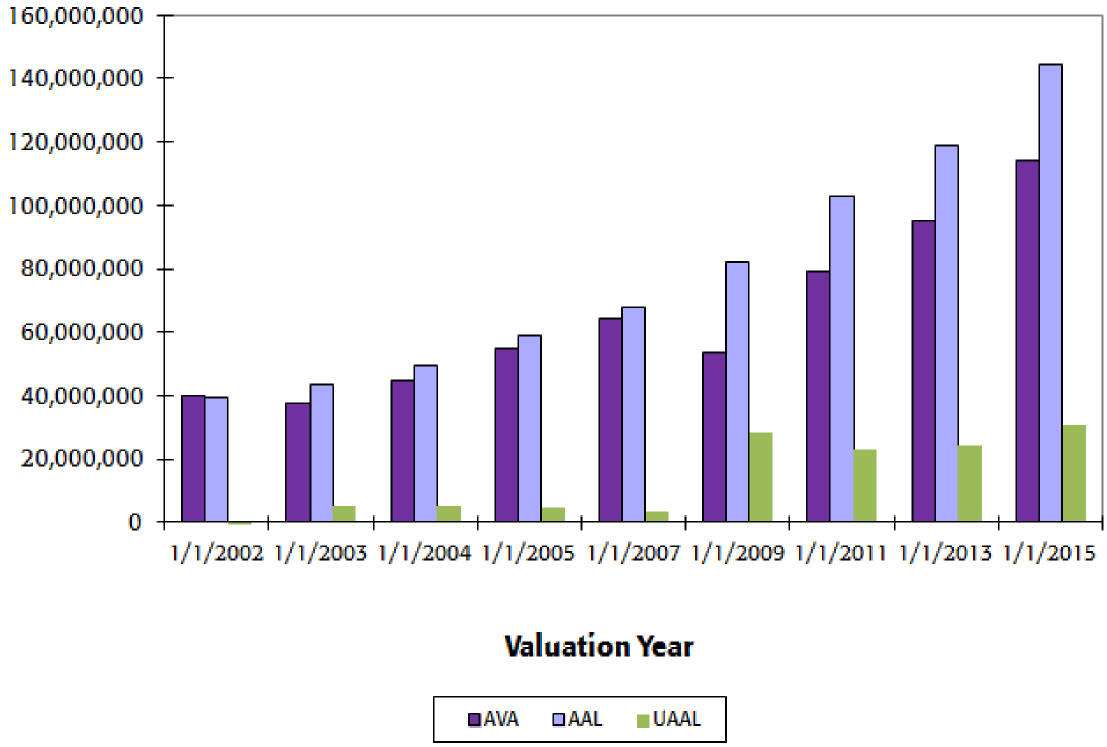
		January 1, 2015	Percentage Change
Active Actuarial Accrued Liability			
Superannuation	$88,490,521		
Death	1,589,735		
Disability	602,502		
Withdrawal	776,231		
Total		$91,458,989	17.6%
Retiree, Inactive, Survivor and Beneficiary Actuarial Accrued Liability			
Retirees and Beneficiaries	$49,929,250		
Disabled	667,641		
Inactive	2,480,082		
Total		53,076,973	28.5%
Total Actuarial Accrued Liability (AAL)		$144,535,962	21.4%
Actuarial Value of Assets (AVA)		113,875,239	19.9%
Unfunded Actuarial Accrued Liability		$30,660,723	27.1%
Funded Ratio (AVA / AAL)			
2015 (7.75% interest rate):		79%	
2013 (7.875% interest rate):		80%	

- Actuarial Accrued Liability (AAL) is the “price” of benefits attributable to benefits earned in past years, or in other words, represents today’s value of all benefits earned by active and inactive members.

- The total AAL is $144,535,962. This along with an actuarial value of assets of $113,875,239 produces a funded status of 79%. This compares to a funded status of 80% for the 2013 valuation.

- The chart on the following page is a history of the unfunded actuarial accrued liability (UAAL) and the valuation assets (AVA) over the course of the past eight actuarial valuations.

History of Actuarial Valuation of Assets (AVA), Accrued Liability (AAL) and Unfunded Actuarial Accrued Liability (UAAL)



Development of Funding Schedule

Net Employer Normal Cost for Fiscal 2016	$737,723
Net 3(8)(c) payments	(320,865)
Amortization	5,648,042
Total Appropriation required for Fiscal 2016	$6,064,900

- The funding schedule is composed of the normal cost, the net 3(8)(c) payments and the amortization of the actuarial accrued unfunded liability and is adjusted by the administrative expense assumption. The contribution is assumed to be made in the beginning of the Fiscal Year (July 1).

- The 3(8)(c) payments is the net of payments made to or from different Chapter 32 Retirement Systems to reflect benefits paid due to service either with the MHFA Retirement System or other Chapter 32 Retirement Systems.

- The contribution amount for Fiscal 2016 is $6,064,900. The funding schedule is presented on page 11. The schedule's length is seven (7) years (for the fresh start base) which is the same as the January 1, 2013 valuation remaining schedule's length. The maximum funding schedule length allowed by Section 22D of Chapter 32 of the Massachusetts General Laws is thirteen years to Fiscal 2030.

- In developing the funding schedule, we used a fresh start approach in which the unfunded actuarial accrued liability (UAAL), other than the UAAL due to past early retirement incentives, is reamortized instead of maintaining the existing amortization amount and separately amortizing the actuarial gain or loss. The use of a fresh-start approach can result in a funding schedule in which the changes in contribution amounts from year to year are more consistent. The amortization increase percentage stayed the same as the prior valuation, 0.00%.

Fiscal Year	Normal Cost	Unfunded Liability	Funding Amortization of UAL	Net 3(8)(c) Payments	Schedule Contribution
2016	737,723	31,957,470	5,648,042	(320,865)	6,064,900
2017	765,388	28,348,409	5,648,042	(320,865)	6,092,564
2018	794,090	24,459,646	5,648,042	(320,865)	6,121,266
2019	823,868	20,269,504	5,648,042	(320,865)	6,151,045
2020	854,763	15,754,625	5,648,042	(320,865)	6,181,940
2021	886,817	10,889,844	5,648,042	(320,865)	6,213,993
2022	920,072	5,648,042	5,648,042	(320,865)	6,247,249
2023	954,575	-	-	(320,865)	633,710

Amortization of Unfunded Liability as of July 1, 2015

Year	Type	Original Amort. Amount	Percentage Increasing	Original # of Years	Current Amort. Amount	Years Remaining
2016	Fresh Start	5,648,042	0.00%	7	5,648,042	7

Notes on Amortization of Unfunded Liability

Year is the year the amortization base was established.
Type is the reason for the creation of the base. Examples are Gain/(Loss) or Fresh Start.
Original Amortization Amount is the annual amortization amount when the base was established.
Percentage Increasing is the percentage that the Original Amortization Amount increases per year.
Original # of Years is the number of years over which the base is being amortized.
Current Amortization Amount is the amortization payment amount for this year.
Years Remaining is the number of years left to amortize the base.

Assumptions and Methodology Summary

The principal actuarial assumptions used in this valuation are the same as the assumptions used in the previous valuation, except where noted, and are summarized in the following table:

Valuation Date	January 1, 2015 Valuation
Interest Rate	7.75% *(7.875% prior valuation)*
Salary Increase	

Years of service	Increase
Less than 1	5.0%
1 and 2	4.75%
3 and 4	4.5%
5 and 6	4.25%
7 and 8	4.00%
Ultimate	3.50%

COLA	3% of $13,000
COLA Frequency	Granted every year
Mortality	RP-2000 table (sex distinct, healthy employees for actives and healthy annuitants for retirees) projected with scale BB and Generational Mortality. For members retired under an Accidental Disability (job-related), 40% of deaths are assumed to be from the same cause as the disability. Disabled mortality is the healthy retiree table ages set forward 2 years. *(Prior valuation used RP2000 projected 18 years with scale AA.)*
Overall Disability	

Ordinary	Accidental
75%	25%

Retirement Rates	Ages 55 – 70 Post April 1, 2012 Hires: Ages 60 – 70
Administrative Expense	$481,000 budget estimated for FY 2016 provided by MHFA Retirement Board.

Assets

a.	Cash	$941,801.49
a.	Fixed Income	$16,965,681.52
	Pooled Domestic Equity Funds	39,795,645.59
	Pooled Global Equity Funds	9,929,309.46
	Pooled Domestic Fixed Income Funds	12,879,907.87
	Pooled International Fixed Income Funds	5,051,571.20
	Pooled Alternative Investments	12,077,321.16
b.	Pooled Real Estate Funds	10,359,479.00
c.	Sub-Total:	$108,000,717.29
d.	Interest Due and Accrued	$94,654.31
e.	Accounts Receivable	5,969,433.72
f.	Accounts Payable	(189,566.68)
g.	Sub-Total:	$5,874,521.35
h.	Market Value of Assets [(c) + (g)]	$113,875,238.64

- We were furnished with the System's annual report by the Board. The market value of assets as of December 31, 2014 (adjusted for payables and receivables) is $113,875,238.64.

- The asset allocation as of December 31, 2014 was approximately 33% cash, receivables, payables and fixed income and 67% equities, alternative investments, real estate and other similar asset classes.

- Historically, 10 to 11% has been the expected long-term rate of return for equities, and 6% to 7% has been the expected long-term rate of return for fixed income securities. Many economists and investment professionals are projecting lower returns of 7.00% to 8.50% for domestic equities, 8.25% to 8.50% for international equities, 9.50% for emerging markets, 8.00% for hedge funds, 10% for venture capital, 6.00% for real estate and 4.50% for core fixed income securities. In light of these projections, as well as historical investment returns, the 7.75% interest rate assumption is within the reasonable assumption range. We encourage close monitoring for changes in investment performance against expectations.

Disclosure Information Under GASB Statement 25

SCHEDULES OF FUNDING PROGRESS
(Dollars In Thousands)

Actuarial Valuation Date	Actuarial Value of Assets A	Actuarial Accrued Liability B	Unfunded AAL (UAAL) B-A	Funded Ratio A/B	Covered Payroll C	UAAL as a % of Covered Payroll (B-A)/C
1/1/2015	$113,875	$144,536	$30,661	79%	$31,240	98%
1/1/2013	$94,976	$119,096	$24,120	80%	$28,044	86%
1/1/2011	$79,406	$102,618	$23,213	77%	$29,744	78%
1/1/2009	$53,530	$82,086	$28,556	65%	$28,475	100%
1/1/2007	$64,121	$67,890	$3,769	94%	$25,562	15%

**Not used*

Notes to Schedules

Additional information as of the latest actuarial valuation follows:

Valuation date	1/1/2015
Actuarial cost method	Entry Age Normal
Amortization method	Closed - Approximate level percent of payroll
Remaining amortization period	7 years for the fresh start base
Asset valuation method	Market value of assets (adjusted by accounts payable and receivable)

Actuarial Assumptions

Investment Rate of Return	7.75% per year
Projected salary increases	5% per year grading down to 3.50% after 8 years of service.

PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2015

The normal cost for employees on that date was:	$2,877,140	9.2% of payroll
The normal cost for the employer was:	$252,041	0.8% of payroll

The actuarial liability for active members was:	$91,458,989
The actuarial liability for retired members was (includes inactives):	$53,076,973
Total actuarial accrued liability:	$144,535,962
System assets as of that date:	$113,875,239
Unfunded actuarial accrued liability:	$30,660,723

The ratio of system's assets to total actuarial liability was:	79%

As of that date the total covered employee payroll was:	$31,240,295

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	7.75% per annum
Rate of Salary Increase:	3.50% per annum ultimate rate (5% graded down to 3.50% over 8 years)

SCHEDULE OF FUNDING PROGRESS (Dollars in $1,000's)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
1/1/2015	$113,875	$144,536	$30,661	79%	$31,240	98%
1/1/2013	$94,976	$119,096	$24,120	80%	$28,044	86%
1/1/2011	$79,406	$102,618	$23,213	77%	$29,744	78%
1/1/2009	$53,530	$82,086	$28,556	65%	$28,475	100%
1/1/2007	$64,121	$67,890	$3,769	94%	$25,562	15%

Actuarial Methods and Assumptions

ACTUARIAL METHODS

Actuarial Cost Method

The Entry Age Normal Actuarial Cost Method has been used in this valuation. Under this method, the normal cost is the amount calculated as the level percentage of compensation necessary to fully fund the prospective benefits from each member's entry age to retirement age.

The actuarial accrued liability represents the theoretical accumulation of all prior years' normal costs for the plan members as if the program had always been in effect. The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over plan assets.

Asset Valuation Method

Market value of assets (adjusted by payables and receivables).

Fiscal Year Adjustment

The actuarial results are adjusted by the valuation interest rate and salary scale to the beginning of Fiscal Year 2016. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

ACTUARIAL ASSUMPTIONS

Investment Return

7.75% per year net of investment expenses. *(7.875% prior valuation)*

Salary Increases

Years of service	Increase
Less than 1	5.0%
1 and 2	4.75%
3 and 4	4.5%
5 and 6	4.25%
7 and 8	4.00%
Ultimate	3.50%

Actuarial Methods and Assumptions
(Continued)

Withdrawal Prior to Retirement

The rates shown at the following sample ages illustrate the withdrawal assumption. Withdrawal rates are set to zero if the retirement rate at that age is nonzero.

Service	
0	11.25%
5	5.70%
10	4.05%
15	2.48%
20	1.50%
25	0.75%
30+	0.0%

Disability Prior to Retirement

The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability:

Age	
25	0.01%
30	0.01%
35	0.02%
40	0.04%
45	0.06%
50	0.07%
55	0.09%
60	0.11%

Disability is assumed to be 75% ordinary and 25% accidental.

Actuarial Methods and Assumptions (Continued)

Rates of Retirement

The rates shown at the following ages illustrate the assumption regarding the incidence of retirement. A member would need to be eligible for the benefit to be assumed to retire. See Summary of Principal Provisions Number 5 for eligibility requirements.

			Hired after 4/1/2012	
Age	Male	Female	Male	Female
50	1%	1.5%	0%	0%
51	1%	1.5%	0%	0%
52	1%	2.0%	0%	0%
53	1%	2.5%	0%	0%
54	2%	2.5%	0%	0%
55	2%	5.5%	0%	0%
56	2.5%	6.5%	0%	0%
57	2.5%	6.5%	0%	0%
58	5%	6.5%	0%	0%
59	6.5%	6.5%	0%	0%
60	12%	5%	25%	30%
61	20%	13%	20%	13%
62	30%	15%	30%	15%
63	25%	12.5%	25%	12.5%
64	22%	18%	22%	18%
65	40%	15%	40%	15%
66	25%	20%	25%	20%
67	25%	20%	25%	20%
68	30%	25%	30%	25%
69	30%	20%	30%	20%
70	100%	100%	100%	100%

Mortality

The RP-2000 mortality table (sex-distinct) projected with scale BB and Generational Mortality. (*Prior valuation used RP-2000 mortality table projected 18 years with scale AA.).* During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used.

Disabled Life Mortality

The RP-2000 mortality table for healthy annuitants (sex-distinct) projected with scale BB and Generational Mortality set-forward by 2 years. Death is assumed to be due to the same cause as the disability 40% of the time. *(Prior valuation used RP-2000 mortality table projected 18 years with scale AA).*

Actuarial Methods and Assumptions (Continued)

Regular Interest Rate Credited to Annuity Savings Account

2% per year.

Family Composition

Members assumed married with 2 dependent children – one male and one female both age 15; age difference between member and spouse assumed to be 3 years (the male being the older).

Cost-of-Living Increases

A 3% COLA on the first $13,000 of a member's retirement allowance is assumed to be granted every year.

Administrative Expenses

Estimated budgeted amount of $481,000 for the Fiscal Year 2016 excluding investment management fees and custodial fee is added to the Normal Cost.

Step Increases

Step increases are assumed to be part of the salary increase assumption.

Credited Service

All service is assumed to be due to employment with the agency.

3(8)(c)

Net 3(8)(c) payments are added to the contribution amount, they have not been included in the Accrued Liability. They are assumed to remain constant.

Contribution Timing

Contributions are assumed to be at the beginning of the fiscal year (July 1).

Valuation Date

January 1, 2015.

Summary of Principal Provisions

1. PARTICIPANT

Participation is mandatory for all full-time employees whose employment commences before age 65.

2. MEMBER CONTRIBUTIONS

Member contributions vary depending upon date hired as follows:

Date of Hire	Member Contribution Rate
Prior to 1975	5% of Pay
1975 – 1983	7% of Pay
1984 – June 30, 1996	8% of Pay
After June 30, 1996	9% of Pay

Members hired after 1978 contribute an additional 2% of pay over $30,000.

3. PAY

a. Pay

Gross regular compensation excluding bonuses, overtime, severance pay, unused sick pay, and other similar compensation.

b. Average Pay

The average of pay during the three consecutive years that produce the highest average or, if greater, during the last three years (whether or not consecutive) preceding retirement. For members hired after April 1, 2012, five-year averages will be used.

4. CREDITED SERVICE

Period during which an employee contributes to the retirement system plus certain periods of military service and "purchased" service.

5. SERVICE RETIREMENT

a. Eligibility

1) Completion of 20 years of credited service or attainment of age 55 and completion of 10 years of credited service. If hired prior to 1978, attainment of age 55.

2) Hired after April 1, 2012: Age 60 and completion of 10 years of service

Summary of Principal Provisions (Continued)

b. Retirement Allowance

Determined as the product of the member's benefit percentage, average pay and credited service, where the benefit percentage is shown below (maximum allowance of 80% of average pay):

Benefit Percentage	Group 1
2.5%	65+
2.4	64
2.3	63
2.2	62
2.1	61
2.0	60
1.9	59
1.8	58
1.7	57
1.6	56
1.5	55
Hired after 4/1/2012*	
2.5%	67+
2.35	66
2.20	65
2.05	64
1.90	63
1.75	62
1.60	61
1.45	60

*Reduction is .125% for each year early instead of .15% per year for employees with over 30 years of service.

In addition, veterans receive an additional $15 per year for each year of credited service up to 20 years

6. DEFERRED VESTED RETIREMENT

a. Eligibility

Completion of 10 years of credited service.

b. Retirement Allowance

Determined in the same manner as "Service Retirement" section above with the member eligible to start collecting a benefit at age 55, (or age 60 for post-April 1, 2012 hires) or defer until later at his or her discretion. If a member chooses, his or her contributions with interest may be withdrawn. The amount of interest he or she will receive depends on length of service and whether or not the termination of employment was voluntary.

Summary of Principal Provisions
(Continued)

7. ORDINARY DISABILITY RETIREMENT

a. Eligibility

Non-job related disability after completion of 10 years of credited service.

b. Retirement Allowance

Determined in the same manner as "Service Retirement" section and calculated as if the member had attained age 55 (or age 60 for those hired after April 1, 2012), if younger. Veterans receive 50% of pay (during final year) plus an annuity based on accumulated member contributions with interest.

8. ACCIDENTAL DISABILITY RETIREMENT

a. Eligibility

Disabled as a result of an accident in the performance of duties. No age or service requirement.

b. Retirement Allowance

72% of pay plus an annuity based on accumulated member contributions with interest. Also, a dependent's allowance per year for each child. Total allowance not to exceed 100% of pay (75% for members hired after 1987).

9. NON-OCCUPATIONAL DEATH

a. Eligibility

Dies while in active service, but not due to occupational injury.

b. Retirement Allowance

Benefit as if Option C had been elected (see below) and member had attained age 55 (or age 60 for those hired after April 1, 2012) if younger. Minimum monthly benefits provided as follows: spouse - $500, first child - $120, each additional child - $90

10. OCCUPATIONAL DEATH

a. Eligibility

Dies as a result of an occupational injury.

Summary of Principal Provisions
(Continued)

b. Benefit Amount

72% of pay plus refund of annuity savings fund balance. In the case of an accidental disability retiree who dies of the same cause, the beneficiary receives 72% of the last 12 months salary or the current pension amount, whichever is greater.

11. COST-OF-LIVING INCREASES

An increase of up to 3% applied to the first $13,000 of annual benefit. Percentage increase is voted on each year by the Retirement Board.

12. OPTIONAL FORMS OF PAYMENT

- Option A

Allowance payable monthly for the life of the member.

- Option B

Allowance payable monthly for the life of the member with a guarantee of remaining member contributions with interest.

- Option C

Allowance payable monthly for the life of the member with 66-2/3% continuing to the member's beneficiary upon the member's death. If the beneficiary predeceases the member, the allowance amount "pops up" to the non-reduced amount.

Glossary of Terms

- Present Value of Benefits

  Represents the dollar value today of all benefits expected to be earned by current members if all actuarial assumptions are exactly realized.

- Actuarial Cost Method

  The procedure that is used to allocate the present value of benefits between the liability that is attributable to past service (Actuarial Accrued Liability) and that attributable to future service.

Glossary (continued)

- Actuarial Assumptions

  Estimates are made as to the occurrence of certain events that determine the level of benefits to be paid and how long they will be provided. The more important actuarial assumptions include the investment return on assets, salary increases and the rates of turnover, disability, retirement and mortality.

- Actuarial Accrued Liability

  The portion of the Present Value of Benefits that is attributable to past service.

- Normal Cost

  The portion of the Present Value of Benefits that is attributable to benefits to be earned in the coming year.

- Actuarial Assets

  Market value of assets (adjusted by payables and receivables)

- Unfunded Actuarial Accrued Liability

  That portion of the Actuarial Accrued Liability not covered by System Assets.

- PERAC

  Public Employee Retirement Administration Commission, a division of the State government which has regulatory authority over the administration of the retirement system.

- PRIT

  Pension Reserves Investment Trust Fund is the state controlled and administered fund for the investment of assets for members of the retirement system.

- GASB

  Government Accounting Standards Board (issues guidance for disclosure of retirement system liabilities).